Contribution ID: **142** Type: **Oral**

Processing of spectral data by self-similar difference equations.

Friday, 17 November 2023 13:30 (15 minutes)

The application of self-similarity principle is shown in the example of utilizing a system of self-similar difference equations for processing spectral data, in particular the processing luminescence spectrum of quantum dots (Gaussian peak) as well as the kinetics of luminescence decay.
For the spectrum of quantum dots, the relationship between the parameters of the Gaussian function and the parameters of the hierarchical system of equations is shown.
To describe the kinetics of luminescence, the dynamics of the decay coefficient (in the transition region) is shown. For this purpose, a system of two nested difference equations is used, the main equation of which, contains two variable parameters, one of which can be considered as the decay value.
The calculated dependence decay on time is presented and divided into areas with different asymptotics.
The method introduces a mechanism for transition between different functional (continuous) descriptions, based on an elementary mapping of the proposed hierarchical system. This mechanism can be used to solve the interface problem when constructing multiscaling models and phase transition models.

Topics

Session A. Physics of condensed matter and spectroscopy

Primary authors: PAVLOV, Evgen (University of Derby); Prof. YASHCHUK, Valeriy (Taras Shevchenko National University of Kyiv)

Presenter: PAVLOV, Evgen (University of Derby)

Session Classification: Spectroscopy techniques and applications